LOUISIANA NATURAL AND SCENIC RIVERS SYSTEM

PERMIT APPLICATION

Permit # 942 (Assigned by Department)

The Louisiana Department of Wildlife and Fisheries' Scenic Rivers program is authorized by LRS title 56, Chapter 9 Part II. This law requires permits authorizing activities in or affecting rivers that have been designated by the Louisiana Legislature as Natural and Scenic. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary, however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

APPLICANT INFORMATION

Name of Applicant Tellus Operating Group, LLC (Clarke Thomas)	Name of Agent (if any) Headwaters, Inc. (Clay Cromwell)
Address 602 Crescent Place, Suite 100	Address P.O. Box 2836
Address	Address
City, State, Zip Ridgeland, Mississippi 39157	City, State, Zip Ridgeland, Mississippi 39158-2836
Phone 601-898-7444	Phone 601-634-0097

DESCRIPTION OF THE PROPOSED ACTIVITY

Brief summary of the description and purpose of the proposed activity (details to be attached as a separate document)

The project includes the water withdrawal within Middle Fork Bayou D'Arbonne in Claiborne Parish. The water withdrawal is associated with the hydraulic fracturing of five (5) well sites.

Is any portion of the activity complete? YES or (NO) (If yes, indicate month and year of completion)

LOCATION OF PROPOSED ACTIVITY

Stream Name	Middle Fork Bayou D'Arbonne	Names, Addresses, Phone Numbers of Adjacent Property Owners
Parish	Claiborne	See Attachments
Section	35	
Township	22 North	
Range	5 West	
Latitude/Longitude	32.860404, -92.846593	

ENVIRONMENTAL ASSESSMENT

Must be a separate document. See the attached instruction sheet for completing the assessment.

CONFIRMATION OF INFORMATION ACCURACY

Application is hereby made for a Scenic River Permit to authorize the activities described herein. I certify that I am familiar with the information contained in this application and that, to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities, or I am acting as the duly authorized agent of the applicant.

C. Clarke Thomas HSE - Tellus — Signature

7/29/15 — Date

Form # LSR3 December 2014

HEADWATERS INC.
NATURAL RESOURCES CONSULTING

July 28, 2015

Mr. Chris Davis
Biologist, Environmental Investigations
Louisiana Department of Wildlife and Fisheries
Post Office Box 98000
Baton Rouge, Louisiana 70898-9000

Re: Tellus Operating Group, LLC
Surface Water Withdrawal
Middle Fork Bayou D'Arbonne
Claiborne Parish, Louisiana
Scenic Rivers Permit Request

Dear Mr. Davis:

Headwaters, Inc. has been retained by Tellus Operating Group, LLC (Tellus) to serve as agent on their behalf in all matters related to the above referenced Water Withdrawal Project within Claiborne Parish, Louisiana. This letter, with the attached documents, details the specifics of the planned project and contains the necessary information relative to the request for authorization for the project activities under the Louisiana Department of Wildlife and Fisheries (LDWF) Louisiana Natural and Scenic Rivers System.

PROJECT LOCATION

The water withdrawal site is situated along the top bank of Middle Fork Bayou D'Arbonne within Claiborne Parish, Louisiana. The water withdrawal site is located within the Tellus Antioch Oil and Gas Field. Additionally, the site is located generally north of the community of Lisbon and northwest of the City of Homer, Claiborne Parish, Louisiana. More specifically, the project site is located within a portion of Section 35, Township 22 North, Range 5 West, Claiborne Parish, Louisiana. The water withdrawal site may also be referenced by Global Positioning System (GPS) coordinates N32.86047° - W92.84649°.

The proposed area is situated within an existing pipeline right of way that transects Middle Fork Bayou D'Arbonne. A small area located along the south bank of the bayou would be utilized to operate the pump for the water withdrawal operations. Access to the proposed withdrawal site is provided by existing access roads. No new clearings or access would be required to facilitate the planned project.

RIDGELAND, MISSISSIPPI
PO Box 2836, Ridgeland, MS 39158-2836
601-634-0097●601-630-9778(f)

TUPELO, MISSISSIPPI
PO Box 3658 Tupelo, MS 38803-3658

www.headwaters-inc.com

PROJECT DESCRIPTION

Tellus is currently constructing five (5) well sites within the Antioch Oil and Gas Field located in Claiborne Parish, Louisiana. As part of the exploration and completion of the wells, each well will be hydraulically fractured. The fracturing activities will require approximately 8,000,000 gallons of water per well for a total of approximately 40,000,000 gallons. Given the amount of water required to complete the fracturing and the potential of depleting below surface aquifers it is proposed to withdraw surface water from Middle Fork Bayou D'Arbonne.

The water will be pumped from Middle Fork Bayou D'Arbonne through above ground piping to an existing storage pond located within the Antioch Oil and Gas Field. The water will then be pumped from the storage pond to the well sites as needed during the hydraulic fracturing process. The surface water will be pumped from a screened (0.25") in-take hose by a trailer mounted pump. As mentioned, the fracturing activities for the five (5) wells will require approximately 40,000,000 gallons (8,000,000 gallons per well) of water to complete. The pumping rate will be approximately 2,400,000 gallons per day. Based on the planned rates and anticipated delays, it is estimated to take 5 days per well to complete. The fracturing of each well will be staggered to coincide with the completion of each well therefore; the water withdrawal will be conducted in stages and not simultaneously.

The project will not require any land clearing or grading activities. The above ground piping will be placed within existing road and pipeline right-of-ways. Timber mats will be utilized at the withdrawal site if needed to minimize soil disturbance. Best Management Practices (BMP's) will be implemented and maintained as necessary through the water withdrawal sequence to ensure that no secondary adverse impacts to adjacent habitats occur. BMPs may consist of silt fences, hay wattles, timber mats, and any other measures needed to prevent sediment and debris from entering Middle Fork Bayou D'Arbonne. It is the intention of Tellus to complete the water withdrawal utilizing the most effective BMP's to prevent adverse environmental impacts to the bayou. Due to the nature of the project and that minimal activities are occurring below mean high water, adverse impacts to the bayou are not anticipated.

Construction Methodology and Access:

Access to the proposed site would be provided from the south via existing lease roads. No additional access will be needed to complete the water withdrawal activities. The vegetation within the water withdrawal site will not be removed. As mentioned, the proposed water withdrawal site is located within an existing pipeline right-of-way that transects Middle Fork Bayou D'Arbonne. Given this, the site is situated within an open field/herbaceous habitat associated with the pipeline right-of-way. The project will not include any clearing or land grading activities.

The proposed water withdrawal activities will include the placement of the temporary pump along the top bank of Middle Fork Bayou. The above ground piping will be placed within existing road and pipeline right of ways and interconnected to the storage pond located within the Antioch Oil and Gas Field. The intake hose will be placed

within the bayou in a manner as to not prevent navigation within the channel and not restrict recreational opportunity with the bayou. The water levels and flows within the stream channel will be closely monitored during the water withdrawal process for each well site. If a significant drop in the levels or flows of the stream is recorded the water withdrawal will be immediately terminated. The water withdrawal will be conducted after a significant rain event or during seasonal high water to prevent any impacts to the water quantity and quality of the stream. Once the water withdrawal is complete, it is the intention to ensure that the site is stabilized.

PROJECT PURPOSE

Tellus would respectfully request the consideration of the issuance of the appropriate Louisiana Department of Wildlife and Fisheries Scenic Rivers Permit associated with the water withdrawal activities planned within Middle Fork Bayou D'Arbonne. The proposed water withdrawal activities are intended to provide a sufficient supply of water to complete the hydraulic fracturing of five (5) wells. The proposed surface water withdrawal will also prevent the potential depletion of below surface aquifers. The water withdrawal activities are proposed to commence in November 2015.

The exact physical location of the proposed water withdrawal site is depicted on the attached copy of the U.S.D.A. National Agricultural Imagery Program (NAIP) 2012 photographic coverage and U.S.G.S. Arizona, Louisiana Quadrangle Site Maps (Attachment A).

PERMITTING PROCESS

As previously noted, our firm is acting as agent to obtain all pertinent environmental permits required for the exploration and completion of the five (5) wells. The following is a listing of permits obtained or requested on behalf of Tellus:

1. U.S. Army Corps of Engineers (USACE) Section 404 Wetlands Permit –
   a. Nisely 28HC #1 Alt – Dated January 26, 2015 (MVK-2014-1088)
   b. Jones 28HC #1 Alt – Dated June 1, 2015 (MVK-2015-226)
   c. McAdams 33HC #1 Alt – Dated April 7, 2015 (MVK-2014-1090)
   d. Wilkins 28HC #1 Alt – TBD
   e. Nisely 33HC #1 Alt - TBD

2. Louisiana Department of Natural Resources (LDNR) – Coordinating with LDNR on the Louisiana Running Surface Water Use Cooperative Endeavor Agreement

COMPLIANCE HISTORY

Headwaters has had the privilege to work with Tellus for approximately 9 years. We have assisted on their projects throughout the southeastern United States. It has been our experience that Tellus has respected and completed the pertinent environmental permitting requirements for each of their projects. To our knowledge, Tellus has not been cited for a violation of the Scenic Rivers Act.

AVOIDANCE AND MINIMAZATION

During the initial planning of this project, Tellus researched alternative water supplies that would best meet the objective of their project. The alternative water supplies considered the minimization of potential to below surface aquifer damage while providing a water supply suitable for the completion of the hydraulic fracturing of the five (5) wells. Upon the completion of the alternative analysis, it was determined that the surface water withdrawal best suits the project providing the least environmentally damaging practicable alternative.

1. No Hydraulic Fracturing Alternative: The no hydraulic fracturing alternative was initially dismissed as a viable alternative due to the overall success of the wells and the increased productivity of the wells with hydraulic fracturing. Under this alternative, the wells would not be hydraulically fractured, reducing the productivity of the wells and therefore determining that the projects are not financially viable.

2. Water Transport via Tractor Trailer: When considering water supplies for the hydraulic fracturing, transporting the water from Claiborne Lake was also considered. However, due to the quantity of water required and the distance from the planned projects, the transportation cost was not considered a viable option for the project. Further, the inability to store the transported water in a secure and authorized location proved to be a logistical concern when designing the project. Further, this alternative would increase truck traffic and safety within the community would likely be a concern. As a result, this was not considered as a viable option for the planned project.

3. Ground Water: Initial considerations were given to the possibility of utilizing below surface water from local aquifers. However, given the amount of water required to complete the hydraulic fracturing and the potential to deplete available ground water supplies this alternative was considered not to be a viable alternative for the planned project. The use of abundant surface water is encouraged over the use of high quality ground water for hydraulic fracturing and therefore, further consideration to use a ground water source was not dismissed as a viable option.

4. Chosen Alternative: The chosen alternative includes the water withdrawal within Middle Fork Bayou D'Arbonne. The bayou is located in close proximity to well sites and has sufficient surface water to complete the hydraulic fracturing of each planned well. The withdrawal activities will be closely monitored to prevent any impacts to water quantities within Middle Fork Bayou D'Arbonne. Further, monitoring of the water withdrawal location is proposed to manage the quality of the take point to prevent secondary adverse conditions to the bayou or the

adjacent habitats. Further, utilizing the surface water source during sufficient flows and strategically for each planned well site will allow the stream reach to naturally recharge over time from rainfall.

BEST MANAGEMENT PRACTICES

Best Management Practices (BMP's) will be implemented and maintained as necessary through the water withdrawal process to ensure that no secondary adverse impacts to adjacent habitats occur. As mentioned, the project will not include any land clearing or grading activities. BMPs may consist of silt fences, hay wattles, timber mats, and any other measures needed to prevent sediment and debris from entering Middle Fork Bayou D'Arbonne. The water withdrawal activities are not intended to create any long term impacts to water quality or fisheries habitat currently present within the site.

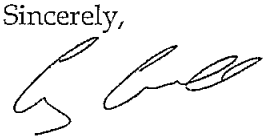
CONCLUSION

At this time, we respectfully request your agency's review of the submitted information covering the proposed project activities. We also respectfully request your agency's consideration of the authorization for the Louisiana Natural and Scenic Rivers System Permit.

For mailing purposes, the applicant's address is as follows:
Mr. Clarke Thomas
Tellus Operating Group, LLC
602 crescent Place, Suite 100
Ridgeland, Mississippi 39157

As always, we appreciate your assistance in this matter. If you have any questions or need any additional information, please do not hesitate to contact us.

Sincerely,



J. Clay Cromwell
Vice President

JCC\
Attachment

C: Mr. Clarke Thomas, Tellus Operating Group, LLC

State of Louisiana

BOBBY JINDAL
GOVERNOR

DEPARTMENT OF WILDLIFE AND FISHERIES

ROBERT J. BARHAM
SECRETARY

Dear Scenic River Permit Applicant:

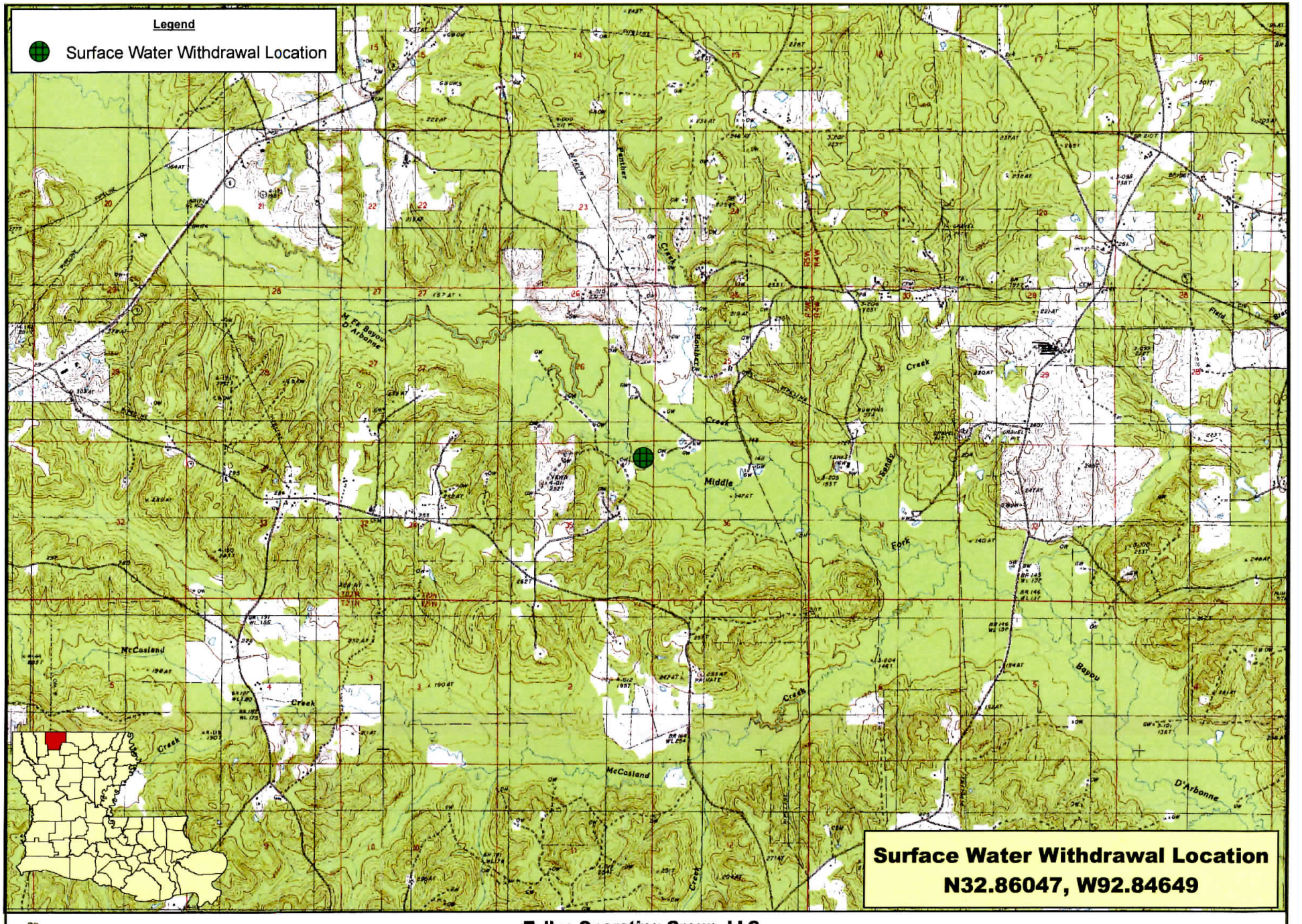
Please review and concur on the following statement regarding the issuance of permits by the Louisiana Department of Wildlife and Fisheries. This agreement must be signed and returned before a Scenic River Permit can be issued.

"I have been advised and do understand that by applying for and accepting a Scenic Rivers permit issued by the Louisiana Department of Wildlife and Fisheries, I am being allowed to engage in an activity which would otherwise be prohibited by law or for which a permit is required. I understand that the permit is not a license and confers no property right upon me. I specifically agree to abide by all State and Federal fish and wildlife laws and regulations, and all State and Federal laws and regulations which relate to this permit or the permitted activity, and by all other terms and conditions of this permit. I understand that the permit for which I am applying may be suspended, annulled, withdrawn or revoked and that I may be assessed civil penalties, all in accordance with the provision of the Louisiana Administrative Procedure Act, and that I may be denied future permits as a consequence of my failure to fully and completely comply with the terms and conditions of the permit, as well as other laws and regulations pertinent thereto. If served with or notified of a cease and desist order signed by the Scenic Rivers Administrator, I agree to immediately and without delay cease all activities and operations which relate to the permitted activity or which are impacting the Scenic River, until such time as the matter can be resolved in an adjudicatory hearing pursuant to the Louisiana Administrative Procedure Act. I understand and agree that any permit issued to me by the Louisiana Department of Wildlife and Fisheries is in the nature of a privilege which is being voluntarily extended to me by the Department and the failure on my part to cooperate with the Department can result in the loss of the privilege conferred and the denial of future requests for permits. By accepting this permit, I evidence my agreement to be bound by all conditions and stipulations set forth herein."

A. [signature] HSE - Tech 5 — 7/29/15

Authorized Signature — Date

REV. 12/7/98



HEADWATERS INC.
NATURAL RESOURCES CONSULTING
WWW.HEADWATERS-INC.COM

Tellus Operating Group, LLC
Antioch Oil and Gas Field
Sec. 35, T 22 N, R 5 W
Claiborne Parish, Louisiana

NORTH
1:50,000

General Location Map
USGS Louisiana Quad

0 2,550 5,100 Feet

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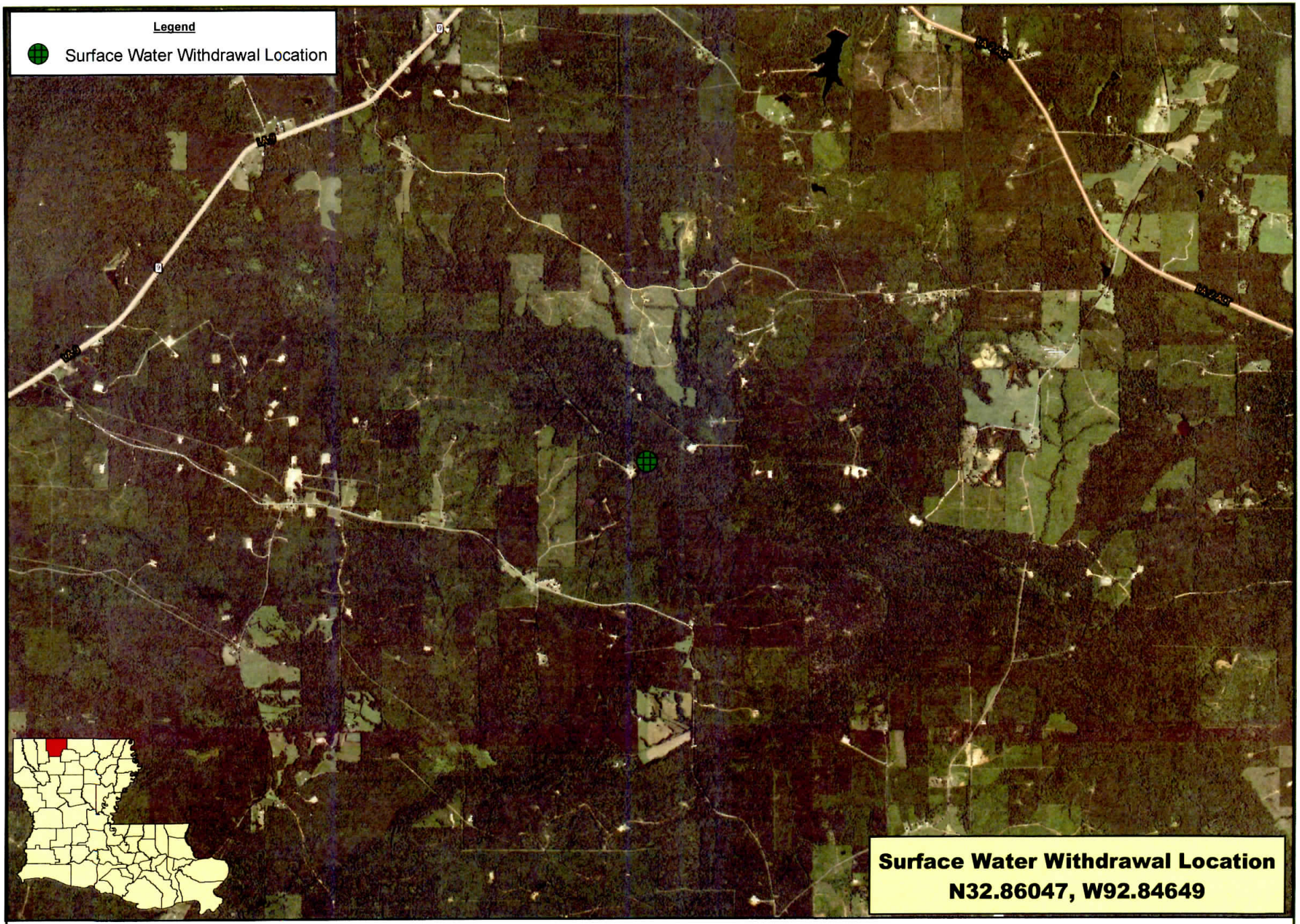
7/29/2015 --- AMG



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Tellus Operating Group, LLC
Antioch Oil and Gas Field
Sec. 35, T 22 N, R 5 W
Claiborne Parish, Louisiana

NORTH
1:50,000

General Location Map

USDA NAIP 2012

0 2,550 5,100 Feet

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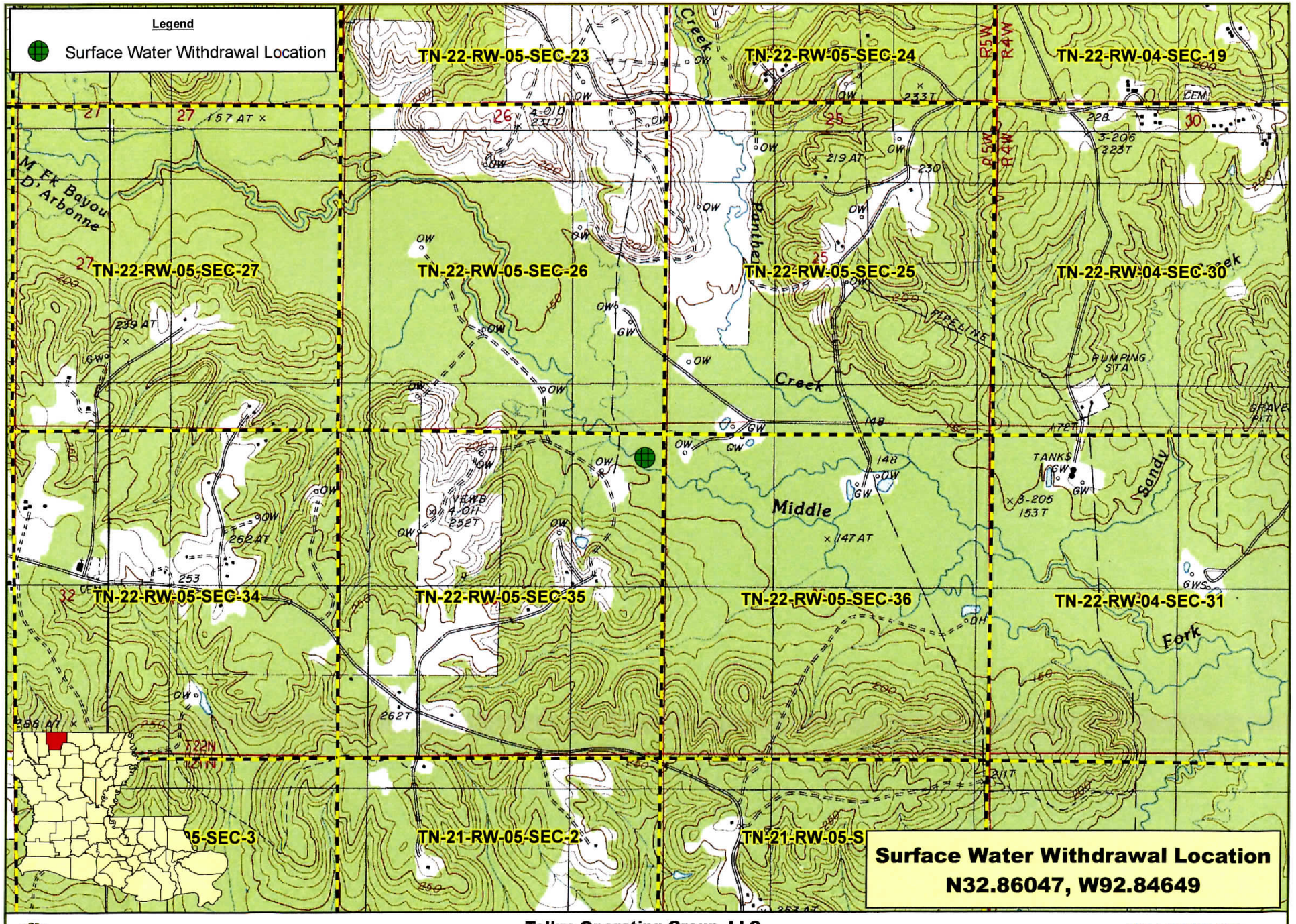

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WWW.HEADWATERS-INC.COM

Tellus Operating Group, LLC
Antioch Oil and Gas Field
Sec. 35, T 22 N, R 5 W
Claiborne Parish, Louisiana

NORTH
1:24,000

Site Location Map
USGS Louisiana Quad
0 1,200 2,400 Feet

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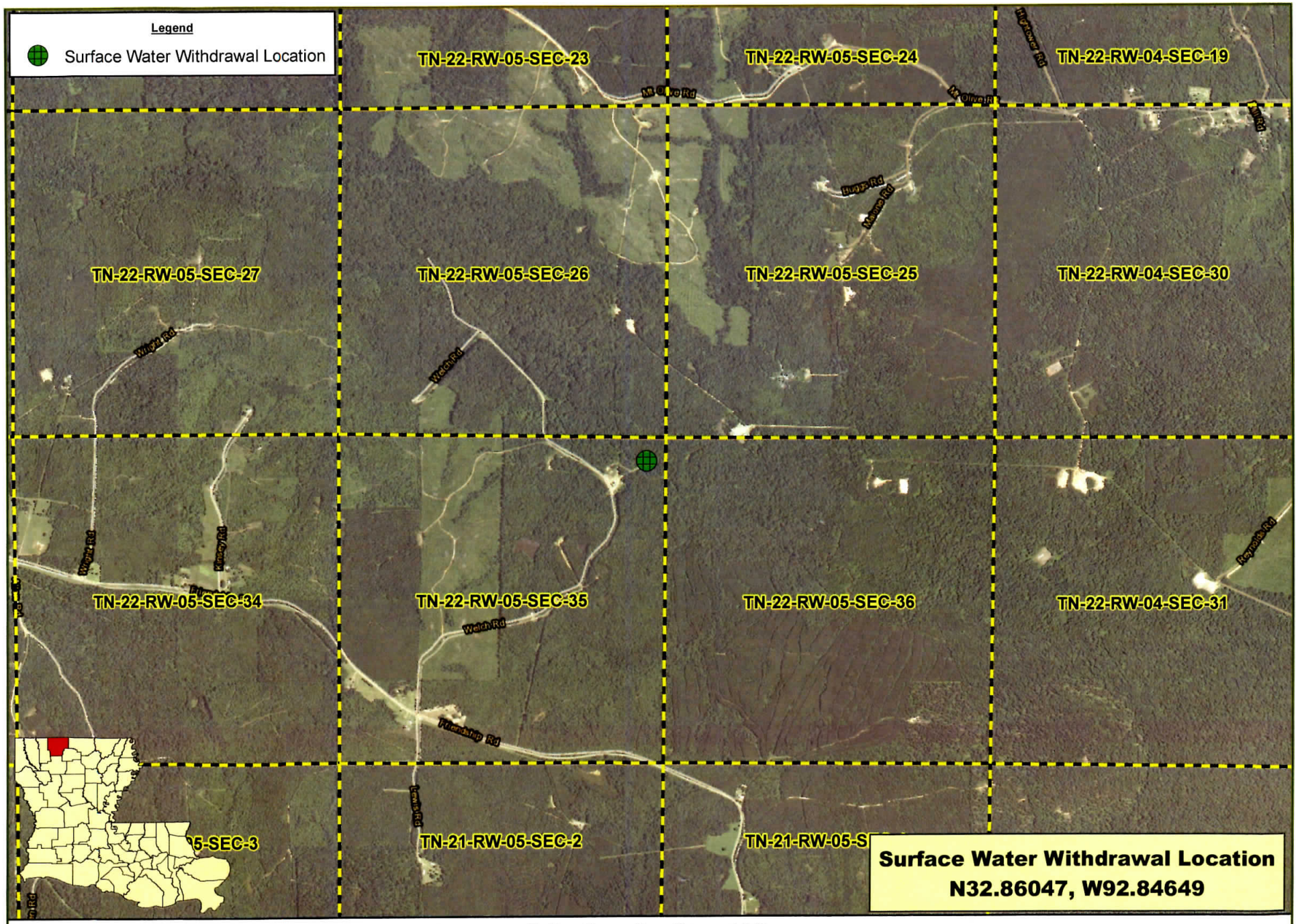

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NORTH
1:24,000

Site Location Map
USDA NAIP 2012
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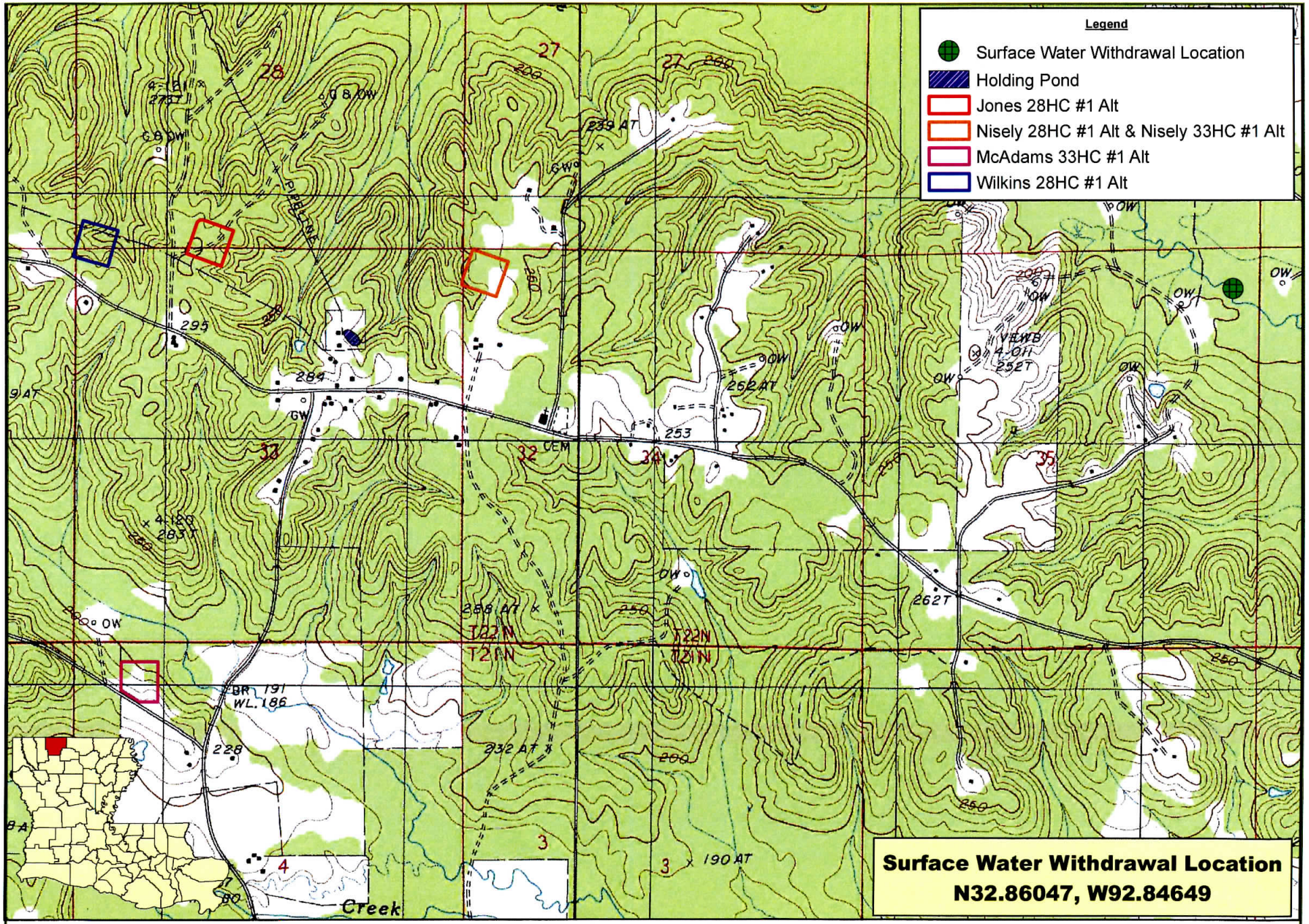

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Site Location Map
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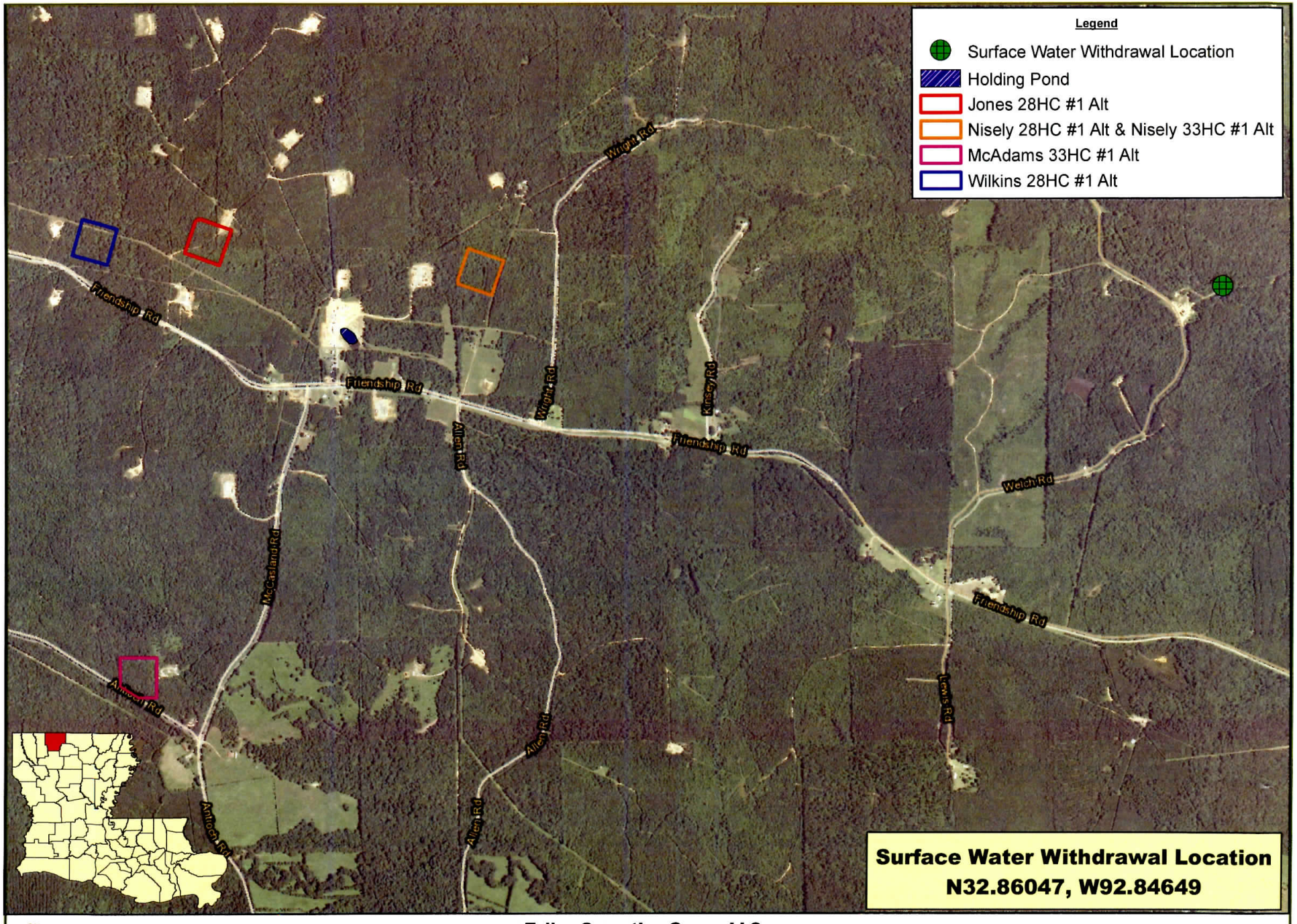

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NORTH
1:20,000

Site Location Map
USDA NAIP 2012
0 1,000 2,000 Feet

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7/29/2015 --- AMG

Tellus – Middle Fork Bayou D'Arbonne Water Withdrawal Project

Claiborne Parish, Louisiana
July 2015

PHOTOGRAPH #1

View of Middle Fork Bayou D'Arbonne. Photo is taken looking downstream from the proposed withdrawal location.

PHOTOGRAPH #2

View of Middle Fork Bayou D'Arbonne. Photo is taken looking upstream from the proposed withdrawal location.

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Tellus – Middle Fork Bayou D'Arbonne Water Withdrawal Project

Claiborne Parish, Louisiana
July 2015

PHOTOGRAPH #3

View of the proposed pump location located along the south bank of Middle Fork Bayou D'Arbonne.

PHOTOGRAPH #4

View of the existing easement that provides access to the proposed water withdrawal location. Photo is taken looking southwest.

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Tellus – Middle Fork Bayou D'Arbonne

Water Withdrawal Project

Claiborne Parish, Louisiana
July 2015

PHOTOGRAPH #3

View of the adjacent bottomland hardwood forested habitat located to the north of the proposed withdrawal location. The project will include encroach within this habitat.

PHOTOGRAPH #4

View of the storage pond associated with the water withdrawal project. The storage pond is located within an existing Tellus facility in the Antioch Oil and Gas Field.

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ATTACHMENT C

Environmental Assessment

RIDGELAND, MISSISSIPPI
PO Box 2836, Ridgeland, MS 39158-2836
601-634-0097●601-630-9778(f)

TUPELO, MISSISSIPPI
PO Box 3658 Tupelo, MS 38803-3658

www.headwaters-inc.com

Environmental Assessment

Prepared for:

Louisiana Department of Wildlife and Fisheries
Scenic Rivers Program
P.O. Box 98000
Baton Rouge, Louisiana 70898-9000

On Behalf Of:

Tellus Operating Group, LLC

Antioch Oil and Gas Field Water Withdrawal

July 2015

HEADWATERS INC.
NATURAL RESOURCES CONSULTING

TABLE OF CONTENTS

ENVIRONMENTAL ASSESSMENT
TELLUS OPERATING GROUP, LLC
PLANNED WATER WITHDRAWAL SITE
CLAIBORNE PARISH, LOUISIANA

1.0 INTRODUCTION

Tellus Operating Group, LLC (Tellus) is preparing to complete the exploration activities associated with five (5) well sites located within the Tellus Antioch Oil and Gas Field, Claiborne Parish, Louisiana. The wells are referenced as follows:

1. Nisely 28HC #1 Alt
2. Jones 28HC #1 Alt
3. McAdams 33HC #1 Alt
4. Wilkins 28HC #1 Alt
5. Nisely 33HC #1 Alt

As part of the exploration activities the five (5) referenced wells will by hydraulically fractured. To complete the fracturing process Tellus proposes to withdraw water from Middle Fork Bayou D'Arbonne, which is located in relative close proximity to each planned well sites. The water withdrawal site is located north of the community of Lisbon and northwest of the City of Homer, Claiborne Parish, Louisiana. More specifically, the water withdrawal site is located within a portion of Section 35, Township 22 North, Range 5 West, Claiborne Parish, Louisiana. The water withdrawal site may also be referenced by Global Positioning System (GPS) coordinates N32.86047° - W92.84649°.

2.0 PURPOSE AND NEED

The proposed water withdrawal activities are associated with the exploration and development of five (5) well sites located within the existing Antioch Oil and Gas Field. The water that will be withdrawn from Middle Fork Bayou D'Arbonne will be utilized in the hydraulic fracturing of each planned well. The exploration and production of hydrocarbons will be a benefit to the public through the increase of available oil and gas resources.

3.0 PROJECT DESCRIPTION

Tellus is planned to drill five (5) well sites within the Antioch Oil and Gas Field located in Claiborne Parish, Louisiana. As part of the exploration and completion of the wells, each well will be hydraulically fractured. Given the amount of water required to complete the fracturing process and the potential harm to below surface aquifers it is

proposed to withdraw the necessary water from Middle Fork Bayou D'Arbonne, which is located within close proximity to the planned well sites.

The planned withdrawal point is referenced as Water Withdrawal Point 1 and is located at N32.86047 - W 92.84649. The water will be piped above ground to a storage pond located at an existing tank battery site within the Antioch Oil and Gas Field. The water will then be pumped from the storage pond to well sites as needed during the fracturing process of each well. The surface water will be pumped from a screened in-take hose by a trailer mounted pump. The hydraulic fracturing of the five (5) wells will require approximately 8,000,000 gallons of water per well for a total of 40,000,000 gallons. The pumping rate will be approximately 1,680 gallons per minute. Based on the rates with constant pumping, withdrawal will take approximately 5 days per well, not including constant water withdrawal. Given that the fracturing of each well will be staggered to coincide with the completion of the exploration activities pumping will be in stages.

Best Management Practices (BMP's) will be implemented and maintained as necessary through the water withdrawal sequence to ensure that no secondary adverse impacts to adjacent habitats occur. BMPs may consist of silt fences, hay wattles, timber mats, and any other measures needed to prevent sediment and debris from entering Middle Fork Bayou D'Arbonne. It is the intention of Tellus to complete the water withdrawal utilizing the most effective BMP's to prevent adverse environmental impacts to the bayou. Due to the nature of the project and that minimal activities are occurring below mean high water, adverse impacts to the bayou are not anticipated.

4.0 EXISTING LAND USE

The property utilized for the water withdrawal is privately owned and utilized for timber production and recreational purposes. The pump and associated intake equipment will be situated within an existing pipeline easement. Given this no clearing will be necessary along the top bank of Middle Fork Bayou D'Arbonne. Middle Fork Bayou D'Arbonne, a relatively permanent water (RPW) with typical year round flows has recreational potential of fishing and/or small boating. The channel width at the withdrawal point is approximately 40 feet, measured between the ordinary high water marks.

5.0 WILDERNESS QUALITIES

The general setting in which the water withdrawal site is located is dominated primarily by undeveloped forestland. As mentioned, the withdrawal point is located within an existing pipeline easement associated with the adjacent well sites to the southwest and northeast. Well sites and associated infrastructure are located

throughout the general area. As such, the increased presence of human activities within the vicinity of the project area has likely reduced the wilderness qualities of the area as well as fragmenting the forestland habitat. The proposed water withdrawal activities are not anticipated to alter the wilderness qualities within the area from their current conditions.

6.0 SCENIC VALUE

As previously mentioned, the planned withdrawal site is situated within an existing pipeline easement along Middle Fork Bayou D'Arbonne. Given this, no clearing or land grading will be required for the water withdrawal activities. Additionally, the water withdrawal activities will be conducted within a short time frame and are not expected to affect the scenic value of the bayou.

7.0 ECOLOGICAL REGIMES

The proposed water withdrawal site is located along the top bank of Middle Fork Bayou D'Arbonne within an existing pipeline easement. The areas adjacent to the withdrawal site are comprised of a mixed pine and hardwood forested habitat. The water withdrawal activities will be contained within the existing open field area associated with the pipeline easement.

Middle Fork Bayou D'Arbonne can be described as a flow-through lotic ecosystem. This feature is characterized by inundation and flowing water throughout the year. Middle Fork Bayou D'Arbonne flows into Bayou D'Arbonne Lake (USGS 8 digit HUC 08040206) and now serves to aid in relieving storm water runoff from the general area. Middle Fork Bayou D'Arbonne flows into Bayou D'Arbonne, which flows into the Ouchita River. The Ouchita River flows into the Black River, which flows into the Red River. The Red River flows into the Atchafalaya River which empties into the Gulf of Mexico via the Atchafalaya Bay. Middle Fork Bayou D'Arbonne supports a wide variety of aquatic flora and fauna. A wide variety of fish species such as largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlophus*), and white perch (*Morone americana*). Many migrant and neotropical migrant avian species utilize the bayou during parts of the year for feeding, mating and cover. Many native avian species also utilize the bayou throughout the year.

As a part of the water withdrawal activities, no disturbances are anticipated within the bayou. Minimal disturbances along the top bank of the channel are anticipated during the water withdrawal activities.

BMP's will be implemented and maintained as necessary through the water withdrawal process to ensure that no adverse impacts to Middle Fork Bayou D'Arbonne occur and

to prevent secondary adverse impact to adjacent habitats. BMPs may consist of silt fences, hay wattles, timber mats, and any other measures needed to prevent sediment and debris from the water withdrawal process from entering Middle Fork Bayou D'Arbonne.

The water withdrawal activities would not be anticipated to create any impacts to the channel and is not intended to create long term impacts to water quality or current fisheries habitat. Flora and fauna communities, potentially present within the confines of the project site, will only be disturbed or displaced within the limits of the withdrawal site for a short duration during the withdrawal process.

8.0 RECREATIONAL USE/OPPURTUNITES

The planned water withdrawal will be constructed within the existing pipeline easement and will not require additional clearings or improvements along the bank of the bayou. The water withdrawal activities are not anticipated to create or remove any recreational uses or opportunities within the area. Additionally, the water withdrawal activities are not anticipated to hinder the recreational boating usage along Middle Fork Bayou D'Arbonne.

9.0 AESTHETIC VALUE

As previously mentioned, the planned water withdrawal will be conducted from within the existing pipeline easement. The utilization of the existing opening will prevent any clearing or land disturbances. The water withdrawal activities will be conducted within a relatively short time frame and is not anticipated to affect the aesthetic value of Middle Fork Bayou D'Arbonne. Upon the completion of the project, the pump and associated equipment will be removed and the site will be restored the pre-construction conditions. However, as noted, the withdrawal location is within an existing easement and will be maintained as an open field habitat or crossing by the lease holder.

10.0 FISH AND OTHER AQUATIC LIFE

The proposed water withdrawal activities will be conducted within Middle Fork Bayou D'Arbonne. The bayou provides habitat to many species of fish including largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlophus*), and white perch (*Morone americana*). Minimal disturbance within the bayou is anticipated with the water withdrawal activities. Plant and animal communities will only be disturbed or displaced within the limits of the water withdrawal location for a short duration. These communities will be allowed to naturally restore themselves following the water withdrawal activities. Additionally, a filter screen will be utilized on the pump intake to prevent the accidental take of any aquatic species. Long term impacts to the fisheries

habitat or the ecosystem within the bayou are not anticipated as a part of the planned activities.

11.0 WILDLIFE

Many migrant and neotropical migrant avian species utilize the bayou during parts of the year for feeding, mating, and cover. Many native avian species also utilize the bayou throughout the year including, but not limited to the bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), wood ducks (*Aix sponsa*), black-bellied whistling ducks (*Dendrocygna autumnalis*), and various species of egrets and herons.

11.1.0 Threatened and Endangered Species

Potential impacts to threatened and endangered species were assessed as a part of the initial project planning. Species accounts and habitat requirements were collected and reviewed from the Louisiana Department of Wildlife and Fisheries. According to Claiborne Parish lists provided by the U.S. Fish and Wildlife Service (USFWS), the Louisiana black bear (*Ursus americanus*) and the northern long-eared bat (*Myotis septentrionalis*) are listed as threatened and/or endangered species. Although no longer listed, the potential presence of the bald eagle (*Haliaeetus leucocephalus*) was assessed during the site reconnaissance. It should be mentioned that no proposed or critical habitat exists on the proposed project locations.

11.1.1 Louisiana Black Bear

The Louisiana black bear is a large, shy, bulky mammal readily recognizable. The head is rather blunt in profile, eyes relatively small, and nose pad broad. The black bear dens in hollow logs and large tree cavities during winter. The bear is usually solitary, although cubs remain with the mother for about 9 months. Females produce 1-5 cubs (usually 2) every other year. They are omnivorous, although most of their diet is oak mast and fruits. Primary habitat consists of cypress-tupelo swamp, cypress swamp, bottomland forest and coastal marsh.
http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A08F

During the site reconnaissance, no individual sightings were recorded within the limits of proposed project or the surrounding areas. Adverse impacts to the Louisiana black bear are not anticipated with the proposed water withdrawal activities because habitat loss will not be incurred and all withdrawal activities will be conducted from the existing pipeline easement. No new clearings or forest fragmentation is anticipated as a part of the withdrawal process.

11.1.2 Northern Long-Eared Bat

The Northern Long-eared Bat (NLEB) is one of the species of bats most impacted by the white-nose syndrome disease. Due to declines caused by the white-nose syndrome as well as the continued spread of the disease, the NLEB has now been provided protection under the ESA. The USFWS has also issued the interim 4(d) rule that will attempt to provide landowners, land managers, government agencies and others that conduct activities within the potential NLEB habitat.

Though the primary threat to the existence of the NLEB is the white-nose syndrome, the USFWS is also concerned about potential impacts associated with activities within potential roosts and hibernation areas and associated forest habitat modifications. As noted, the project area is located within what is currently established as a "buffer zone" for the NLEB summer habitat. Based upon our field assessments, upland forestland habitat located adjacent to the water withdrawal site could potentially be utilized by the NLEB for summer habitat. During our field reconnaissance, no individual occurrences of individual NLEBs or nesting or roosting activities were noted. Given the relative size of the upland forestland habitat present, and the significant availability of suitable summer habitat in proximity to the project area it is our opinion that the proposed project construction activities are not likely to adversely affect the NLEB. Additionally, the water withdrawal site is located within an existing pipeline easement and will not require any clearing of forested habitats. Therefore, the proposed water withdrawal activities should not adversely impact the northern long-eared bat.

11.1.3 Bald Eagle

The bald eagle was removed from the federal list of threatened and endangered species list in June 2006 however; it continues to remain listed as endangered within the state of Louisiana. The Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act continue to protect the eagles from a variety of harmful actions and impacts. The National Bald Eagle Management Guidelines have been developed by the USFWS to help minimize impacts from activities that may constitute "disturbance" which is prohibited by the Bald and Golden Eagle Protection Act. The USFWS exercises enforcement discretion to focus on individuals, companies, or agencies that "take" (disturb, harm, or kill) migratory birds without regard for the consequences of their actions and the law, especially when conservation measures such as the National Bald Eagle Management Guidelines are available but have not been implemented.

The bald eagle is a large raptor with an average wingspan of about 5 feet. These birds are primarily riparian and are most often associated with coasts, rivers and lakes, usually nesting near bodies of water where if feeds. The nest of the bald eagle is constructed of large sticks with softer material including dead weeds, cornstalks, grasses, and sod added as nest lining. Nests are very large and can measure up to six feet in width and weigh hundreds of pounds. Often, eagles will reuse their nest year after year. In the southeast, nests are most often constructed in dominant or co-dominant pines and cypress trees. Typical tree species associated with bald eagle nests include loblolly pine (Pinus taeda), bald cypress (*Taxodium distichum*), oak (*Quercus spp.*), cottonwood (*Populus deltoides*) and American sycamore (*Platanus occidentalis*).

Although this species is known to exist within the general area, during our field reconnaissance, no individual occurrences or nests were noted within close proximity to the water withdrawal site. No impacts to this species are expected as a result of the water withdrawal activities.

12.0 HISTORICAL/ARCHEOLOGICAL SITES

As discussed, the proposed water withdrawal site located along Middle Fork Bayou D'Arbonne is located within an existing pipeline easement. No clearing or grading activities will be required to complete the water withdrawal process. Equipment will be placed along the bank of Middle Fork Bayou D'Arbonne with the pump system placed within the bayou. All piping will be placed above ground transporting the pumped water to the planned project sites. Given this, soil disturbance is not anticipated as a part of the planned project. Further, the planned water withdrawal site is located along the bank of the bayou within a floodzone of Middle Fork Bayou D'Arbonne and since the site is located within a previously disturbed pipeline easement, impacts to undiscovered historical/archaeological sites are not anticipated as a part of the planned project.

13.0 GEOLOGICAL RESOURCES

Review of the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Custom Soil Resource Report for Claiborne Parish indicates the project area is contained within Iuka-Dela complex (Io) soil type. This soil type is a moderately well drained soil found on flood plains. It is typically found from 500 feet in elevation to 1,000 feet. The restrictive layer is typically found at more than 80 inches deep with the water table being typically 12 to 60 inches deep. The hydric rating by map unit is 20 meaning Iuka-Dela complex is made up of 20% hydric components. All areas

designated as Iuka-Dela complex soils are not classified as prime farmland. The typical soil profile is below:

H1 – 0 to 7 inches: fine sandy loam
H2 – 7 to 15 inches: loam
H3 – 15 to 70 inches: loam

14.0 BOTANTICAL RESOURCES (Vegetation)

As discussed, the proposed water withdrawal location is situated within an existing pipeline easement. The project area would be described as an open field habitat maintained by the pipeline company. The pipeline is maintained as an open field habitat being periodically clipped or sprayed as a part of the maintenance of the line.

15.0 WATER QUALITY AND QUANTITY

The project will include the water withdrawal activities within Middle Fork Bayou D'Arbonne (subsegment 080610). This segment of Middle Fork Bayou D'Arbonne is listed as being impaired due to dissolved oxygen levels. The water withdrawal activities will be conducted during seasonal high water levels and/or after significant rain events to prevent any impact to the water quality within the bayou. Additionally, water levels and flows will be closely monitored during the water withdrawal and if a substantial drop in either the level or flows is recorded the withdrawal activities will cease and the applicant will notify the Louisiana Department of Natural Resources. During withdrawal, BMP's will be implemented and maintained as necessary through the water withdrawal sequence to ensure that no secondary adverse impacts to adjacent habitats occur. BMPs may consist of silt fences, hay wattles, timber mats, and any other measures needed to prevent sediment and debris from entering Middle Fork Bayou D'Arbonne.

The projected volume needed for the each well is approximately 8,000,000 gallons at a rate of 1,680 gallons per minute. The total volume for all five (5) wells is approximately 40,000,000 gallons. As noted, the withdrawals will not be conducted in stages specifically following the drilling plan for each of the planned wells. The hydrology report completed for the withdrawal location is included in the attachments for your use and review.

16.0 HYDROLOGICAL FEATURES

The proposed project location spans a segment of Middle Fork Bayou D'Arbonne, a perennial stream. The water withdrawal activities is intended to maintain sufficient flows within Middle Fork Bayou D'Arbonne. The project is not intended to

substantially decrease water levels or flows within the bayou. The water withdrawal activities will be closely monitored to ensure the water levels and flows do not drop significantly.

Therefore, hydrological features within the project area should remain unaffected following the water withdrawal activities.

17.0 CULTURAL RESOURCES

As discussed, the proposed water withdrawal site located along Middle Fork Bayou D'Arbonne is located within an existing pipeline easement. No clearing or grading activities will be required to complete the water withdrawal process. Equipment will be placed along the bank of Middle Fork Bayou D'Arbonne with the pump system placed within the bayou. All piping will be placed above ground transporting the pumped water to the planned project sites. Given this, soil disturbance is not anticipated as a part of the planned project. Further, the planned water withdrawal site is located along the bank of the bayou within a floodzone of Middle Fork Bayou D'Arbonne and since the site is located within a previously disturbed pipeline easement, impacts to undiscovered cultural resources are not anticipated as a part of the planned project.

18.0 ECONOMIC IMPACT OF THE PROJECT

The proposed water withdrawal activities are associated with the exploration and development of five (5) well sites located within the existing Antioch Oil and Gas Field. The water that will be withdrawn from Middle Fork Bayou D'Arbonne will be utilized in the hydraulic fracturing of each well. The exploration and production of hydrocarbons will be a benefit to the public through the increase of available oil and gas resources. Additionally, the proposed project(s) will increase tax revenue for the parish and state and potentially create direct and indirect jobs within the local community.

ATTACHMENT D

Adjoining Landowners

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